

WHAT IS CLAIMED IS:

1. A lifting system for use with a hitch mechanism, comprising:
a raise/lower member;
an intermediate mechanism to move the raise/lower member between a lower position and an upper position; and
a control for causing the intermediate mechanism to move the raise/lower member from one position to the other.
2. The lifting system of claim 1, wherein the raise/lower member is capable of engaging and supporting a structure that is capable of being coupled with the hitch mechanism.
3. The lifting system of claim 2, wherein the raise/lower member includes at least a portion that is capable of being slid under the structure to support the structure.
4. The lifting system of claim 1, wherein the raise/lower member is attached with the hitch mechanism.
5. The lifting system of claim 1, wherein the control includes at least a handle member.

6. The lifting system of claim 5, wherein the handle member is attached with the intermediate mechanism.

7. The lifting system of claim 6, wherein the handle member is provided with an opening;

wherein the intermediate mechanism includes at least a link member and a first attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a first opening proximal to an upper end thereof, and wherein the first attachment mechanism includes at least a first bolt and a first nut; and

wherein the link member is attached with the handle member by inserting the first bolt through the first opening of each of the pair of linkage bars and the opening of the handle member, and then securing the first bolt with the first nut.

8. The lifting system of claim 1, wherein the raise/lower member is attached with the intermediate mechanism.

9. The lifting system of claim 8, wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached with a first leg portion and a second end attached with a second leg portion, and a first lever member attached with the horizontal member, wherein the first lever member is provided with an opening;

wherein the intermediate mechanism includes at least a link member and a second attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a second opening proximal to a lower end thereof, and wherein the second attachment mechanism includes at least a second bolt and a second nut; and

wherein the link member is attached with the raise/lower member by inserting the second bolt through the second opening of each of the pair of linkage bars and the opening of the first lever member, and then securing the second bolt with the second nut.

10. The lifting system of claim 1, wherein the control is attached with the intermediate mechanism and wherein the raise/lower member is attached with the intermediate mechanism.

11. The lifting system of claim 10, wherein the control includes at least a handle member, and wherein movement of the handle member moves the intermediate mechanism to move the raise/lower member.

12. The lifting system of claim 11, wherein the handle member is provided with an opening;

wherein the intermediate mechanism includes at least a link member and a first attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a first opening proximal to

an upper end thereof, and wherein the first attachment mechanism includes at least a first bolt and a first nut; and

wherein the link member is attached with the handle member by inserting the first bolt through the first opening of each of the pair of linkage bars and the opening of the handle member, and then securing the first bolt with the first nut.

13. The lifting system of claim 11, wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached with a first leg portion and a second end attached with a second leg portion, and a first lever member attached with the horizontal member, wherein the first lever member is provided with an opening;

wherein the intermediate mechanism includes at least a link member and a second attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a second opening proximal to a lower end thereof, and wherein the second attachment mechanism includes at least a second bolt and a second nut; and

wherein the link member is attached with the raise/lower member by inserting the second bolt through the second opening of each of the pair of linkage bars and the opening of the first lever member, and then securing the second bolt with the second nut.

14. The lifting system of claim 11, wherein the handle member is provided with an opening;

wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached with a first leg portion and a second end attached with a second leg portion, and a first lever member attached with the horizontal member, wherein the first lever member is provided with an opening;

wherein the intermediate mechanism includes at least a link member, a first attachment mechanism, and a second attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a first opening proximal to an upper end thereof and a second opening proximal to a lower end thereof, wherein the first attachment mechanism includes at least a first bolt and a first nut, and wherein the second attachment mechanism includes at least a second bolt and a second nut;

wherein the link member is attached with the handle member by inserting the first bolt through the first opening of each of the pair of linkage bars and the opening of the handle member, and then securing the first bolt with the first nut; and

wherein the link member is attached with the raise/lower member by inserting the second bolt through the second opening of each of the pair of linkage bars and the opening of the first lever member, and then securing the second bolt with the second nut.

15. The lifting system of claim 14, wherein the hitch mechanism is capable of coupling a structure to a vehicle, wherein movement of the handle member in a direction outward from the vehicle moves the intermediate mechanism in a downward direction to lower the raise/lower member.

16. The lifting system of claim 14, wherein the hitch mechanism is capable of coupling a structure to a vehicle, wherein movement of the handle member in a direction inward toward the vehicle moves the intermediate mechanism in an upward direction to raise the raise/lower member.

17. The lifting system of claim 1, further comprising a biasing member.

18. The lifting system of claim 17, wherein the biasing member comprises a spring.

19. The lifting system of claim 18, wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached with a first leg portion and a second end attached with a second leg portion, and a second lever member attached with the horizontal member, wherein the second lever member is provided with an opening; and

wherein an end of the spring is inserted through the opening of the second lever member to attach the spring with the raise/lower member.

20. The lifting system of claim 19, wherein the spring is attached with the raise/lower member to provide a biasing force of pulling the raise/lower member in an upward direction.

21. A hitch mechanism, wherein the hitch mechanism includes a lifting system;

wherein the hitch mechanism comprises:

a first handle member;

a coupling member; and

a first linkage mechanism for linking the first handle member and the coupling member, wherein the first handle member is capable of being moved in order to raise and lower the coupling member; and

wherein the lifting system comprises:

a second handle member;

a raise/lower member; and

a second linkage mechanism for linking the second handle member and the raise/lower member, wherein the second handle member is capable of being moved in order to raise and lower the raise/lower member.

22. The hitch mechanism of claim 21, wherein the second handle member is attached with the second linkage mechanism.

23. The hitch mechanism of claim 23, wherein the second handle member is provided with an opening;

wherein the second linkage mechanism includes at least a link member and a first attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a first opening proximal to

an upper end thereof, and wherein the first attachment mechanism includes at least a first bolt and a first nut; and

wherein the link member is attached with the second handle member by inserting the first bolt through the first opening of each of the pair of linkage bars and the opening of the second handle member, and then securing the first bolt with the first nut.

24. The hitch mechanism of claim 21, wherein the raise/lower member is attached with the second linkage mechanism.

25. The hitch mechanism of claim 24, wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached with a first leg portion and a second end attached with a second leg portion, and a first lever member attached with the horizontal member, wherein the first lever member is provided with an opening;

wherein the second linkage mechanism includes at least a link member and a second attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a second opening proximal to a lower end thereof, and wherein the second attachment mechanism includes at least a second bolt and a second nut; and

wherein the link member is attached with the raise/lower member by inserting the second bolt through the second opening of each of the pair of linkage bars and

the opening of the first lever member, and then securing the second bolt with the second nut.

26. The hitch mechanism of claim 21, wherein the second handle member is attached with the second linkage mechanism, wherein the raise/lower member is attached with the second linkage mechanism, and wherein movement of the second handle member moves the second linkage mechanism to move the raise/lower member.

27. The hitch mechanism of claim 26, wherein the second handle member is provided with an opening;

wherein the second linkage mechanism includes at least a link member and a first attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a first opening proximal to an upper end thereof, and wherein the first attachment mechanism includes at least a first bolt and a first nut; and

wherein the link member is attached with the second handle member by inserting the first bolt through the first opening of each of the pair of linkage bars and the opening of the second handle member, and then securing the first bolt with the first nut.

28. The hitch mechanism of claim 26, wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached

with a first leg portion and a second end attached with a second leg portion, and a first lever member attached with the horizontal member, wherein the first lever member is provided with an opening;

wherein the second linkage mechanism includes at least a link member and a second attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a second opening proximal to a lower end thereof, and wherein the second attachment mechanism includes at least a second bolt and a second nut; and

wherein the link member is attached with the raise/lower member by inserting the second bolt through the second opening of each of the pair of linkage bars and the opening of the first lever member, and then securing the second bolt with the second nut.

29. The hitch mechanism of claim 26, wherein the second handle member is provided with an opening;

wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached with a first leg portion and a second end attached with a second leg portion, and a first lever member attached with the horizontal member, wherein the first lever member is provided with an opening;

wherein the second linkage mechanism includes at least a link member, a first attachment mechanism, and a second attachment mechanism, wherein the link member includes a pair of linkage bars, wherein each of the pair of linkage bars is provided with a first opening proximal to an upper end thereof and a second opening

proximal to a lower end thereof, wherein the first attachment mechanism includes at least a first bolt and a first nut, and wherein the second attachment mechanism includes at least a second bolt and a second nut;

wherein the link member is attached with the handle member by inserting the first bolt through the first opening of each of the pair of linkage bars and the opening of the second handle member, and then securing the first bolt with the first nut; and

wherein the link member is attached with the raise/lower member by inserting the second bolt through the second opening of each of the pair of linkage bars and the opening of the first lever member, and then securing the second bolt with the second nut.

30. The hitch mechanism of claim 29, wherein the hitch mechanism is capable of coupling a structure to a vehicle, wherein movement of the handle member in a direction outward from the vehicle moves the second linkage mechanism in a downward direction to lower the raise/lower member.

31. The hitch mechanism of claim 29, wherein the hitch mechanism is capable of coupling a structure to a vehicle, wherein movement of the handle member in a direction inward toward the vehicle moves the second linkage mechanism in an upward direction to raise the raise/lower member.

32. The hitch mechanism of claim 21, further comprising a biasing member.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

33. The hitch mechanism of claim 32, wherein the biasing member comprises a spring having a first end and a second end.

34. The hitch mechanism of claim 33, wherein the raise/lower member includes a plurality of leg portions, a horizontal member that has a first end attached with a first leg portion and a second end attached with a second leg portion, and a second lever member attached with the horizontal member, wherein the second lever member is provided with an opening; and

wherein the second end of the spring is inserted through the opening of the second lever member to attach the spring with the raise/lower member.

35. The hitch mechanism of claim 34, wherein the second end of the spring is attached with the raise/lower member to provide a biasing force of pulling the raise/lower member in an upward direction.

36. A method of hitching a structure to a vehicle, wherein the structure includes a tongue for engagement with a hitch mechanism attached with the vehicle, comprising:

positioning a member of a lifting system, which is attached with at least one of the hitch mechanism and the vehicle, in a lower position, wherein the member is capable of engaging and supporting the structure tongue;

causing the member to engage and support the structure tongue;

raising the member to an upper position so that the structure tongue is capable of aligning with the hitch mechanism; and

placing the hitch mechanism into coupled engagement with the structure tongue.

37. The method of claim 36, wherein the member is a raise/lower member for engaging and supporting the structure tongue, and wherein the lifting system further includes a control device for operating the raise/lower member and an intermediate mechanism for lowering and raising the raise/lower member in response to the position of the control device.

38. The method of claim 37, wherein the control device is a handle member and the intermediate mechanism includes a mechanical linkage.

39. The method of claim 38, wherein causing the member to engage and support the structure tongue includes moving the vehicle towards the structure until the raise/lower member is positioned underneath the structure tongue.

40. The method of claim 36, further comprising operating the vehicle to move the structure tongue into engagement with the hitch mechanism before placing the hitch mechanism into coupled engagement with the structure tongue.

41. The method of claim 40, wherein operating the vehicle to move the structure tongue into engagement with the hitch mechanism includes moving the vehicle towards the structure until a coupling member of the hitch mechanism is proximal to an opening provided in the structure tongue.

42. The method of claim 36, wherein the hitch mechanism includes a coupling member and a mechanism for moving the coupling member between a hitched and an unhitched position; and wherein placing the hitch mechanism into coupled engagement with the structure tongue includes:

moving the structure tongue into engagement with the coupling member while the coupling member is in the unhitched position; and

placing the coupling member into the hitched position, thereby hitching the structure to the vehicle.

43. The method of claim 42, wherein the structure tongue is provided with an opening and wherein the coupling member includes a pin for fitting into the opening of the structure tongue.

44. The method of claim 42, wherein the mechanism for moving the coupling member includes at least a handle and a mechanical linkage.

45. A method of hitching a dolly to a vehicle, wherein the dolly includes a tongue that is provided with an opening for engagement with a coupling member of a

hitch mechanism attached with the vehicle, wherein the hitch mechanism comprises a first handle member, the coupling member, and a first linkage mechanism for linking the first handle member and the coupling member, wherein the first handle member is capable of being moved in order to raise and lower the coupling member, wherein a lifting system that is attached with the hitch mechanism is provided, wherein the lifting system comprises a second handle member, a raise/lower member, and a second linkage mechanism for linking the second handle member and the raise/lower member, wherein the second handle member is capable of being moved in order to raise and lower the raise/lower member, comprising:

- positioning the raise/lower member underneath the dolly tongue;
- raising the raise/lower member, thereby also raising the dolly tongue;
- positioning the coupling member proximal to the dolly tongue so that the coupling member is capable of engaging the opening of the dolly tongue; and
- inserting the coupling member into the opening of the dolly tongue.

46. The method of claim 45, further comprising lowering the raise/lower member before positioning the raise/lower member underneath the dolly tongue.

47. The method of claim 46, wherein lowering the raise/lower member comprises moving the second handle member to move the second linkage mechanism in a downward direction to move the raise/lower member in the downward direction.

48. The method of claim 45, wherein positioning the raise/lower member underneath the dolly tongue comprises moving the vehicle towards the dolly until the raise/lower member is positioned underneath the dolly tongue.

49. The method of claim 45, wherein raising the raise/lower member, thereby also raising the dolly tongue, comprises moving the second handle member to move the second linkage mechanism in an upward direction to move the raise/lower member in the upward direction.

50. The method of claim 45, wherein positioning the coupling member proximal to the dolly tongue so that the coupling member is capable of engaging the opening of the dolly tongue comprises moving the vehicle towards the dolly until the coupling member is proximal to the opening of the dolly tongue.

51. The method of claim 45, wherein inserting the coupling member into the opening of the dolly tongue comprises moving the first handle member to move the first linkage mechanism in a downward direction to move the coupling member in the downward direction into the opening of the dolly tongue.

52. A method of unhitching a dolly from a vehicle, wherein the dolly includes a tongue that is provided with an opening for engagement with a coupling member of a hitch mechanism attached with the vehicle, wherein a raise/lower member attached with the hitch mechanism is provided, and wherein, when the dolly

is hitched to the vehicle, the coupling member is positioned within the opening of the dolly tongue and the raise/lower member is positioned underneath the dolly tongue, comprising:

raising the coupling member so that it exits from the opening of the dolly tongue;

moving the vehicle so that the dolly tongue is positioned away from the hitch mechanism, wherein the raise/lower member remains positioned underneath the dolly tongue;

lowering the raise/lower member, thereby also lowering the dolly tongue; and

moving the vehicle so that the raise/lower member is no longer positioned underneath the dolly tongue.